



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/856,369	05/21/2001	Shinji Yamamoto	040679-1272	8321
22428	7590	03/29/2004	EXAMINER	
FOLEY AND LARDNER SUITE 500 3000 K STREET NW WASHINGTON, DC 20007			ILDEBRANDO, CHRISTINA A	
			ART UNIT	PAPER NUMBER
			1725	

DATE MAILED: 03/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary**Application No.**

09/856,369

Applicant(s)

SHINJI YAMAMOTO

Examiner

Christina Ildebrando

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 6-16, 17-19, and 21-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Noda et al.

Noda et al. (EP 0 782 880) discloses a catalyst-adsorbent useful in the purification of exhaust gases. The catalyst-adsorbent comprises a monolithic carrier and a catalyst-adsorbent layer formed thereon (page 2, lines 50-60).

With respect to the HC adsorbent, Noda et al. teaches that the adsorbent particles are composed mainly of zeolite, preferably high-silica, hydrogen form zeolites having a Si/2Al of 40 or more (page 5, lines 15-20). Suitable zeolites include ZSM-5, USY, and Beta zeolite (page 5, lines 28-30). It is taught that the zeolites may be used singly or in combination (page 6, lines 35-45). The zeolite may further contain an ion such as Cu, Ag, or Au, or Mg, Ca, Sr, Ba, Y, La, Ti, Ce, Mn, Fe, Cr, Ni, and Zn (pages 5-6) to improve stability and heat resistance.

With respect to the catalyst, it is taught that the catalyst is mainly composed of catalyst particles each comprising a heat resistant inorganic oxide and at least one noble metal selected from Pt, Pd, and Rh located thereon (page 3, lines 40-50). The

Art Unit: 1725

use Pd supported on CeO₂ and Rh supported on ZrO₂ is specifically taught (page 4, lines 25-50).

In an example, Noda et al. specifically teaches a catalyst-adsorbent comprising a first layer of zeolite, a second layer of Rh-loaded ZrO₂, and a third layer of Pd-loaded Al₂O₃-CeO₂ (Example 16). Mixed layers may also be used.

The statements of intended use recited throughout the claims are noted by the examiner. While intended use recitations cannot entirely be disregarded, in composition and article claims, the intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention over the prior art. *In re Casey*, 370 USPQ 235 and *In re Otto*, 312 USPQ 458. It is the position of the examiner that the prior art structure is capable of performing the intended use and therefore meets the instant claims.

Specifically, with regards to claims 3, 6-7, 18, and 21-22 the reference teaches a catalyst layer containing cerium oxide and alumina carrying palladium, and zirconium oxide carrying rhodium (Example 16), considered to correspond to the HC reforming catalyst, NO_x reducing catalyst, and CO reforming catalyst respectively.

With regards to claim 4 and 19, the reference teaches a catalyst layer containing cerium oxide and alumina carrying palladium, and zirconium oxide carrying rhodium (Example 16), considered to correspond to the catalyst layer and upstream layer.

With regards to claim 11 and 26, the reference teaches that the HC adsorbent layer may contain a metal such as magnesium, calcium, or barium (page 6, lines 25-30), considered to meet the NO_x reducing catalyst contained in the HC adsorbent layer.

With regards to claim 15, Table 2 (page 10) details an engine which generates an exhaust gas which meets the claimed hydrogen/reducing components ratio.

With regards to the ratio recited in claim 1 and 16, this ratio is taken by the examiner as a statement of the composition's intended use in the purification of exhaust gas. With regard to claim 15, it is the position of the examiner that the claim requires a device which is capable of controlling the composition of the exhaust gas which is met by the reference at page 8, lines 20-30.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Noda et al.

3. Claims 1-2, 15-17, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Ikeda et al.

Ikeda et al. (EP 0 852 966) teaches a catalyst composition useful in the purification of exhaust gases. Ikeda et al. teaches that the catalyst comprises a first powder containing rhodium and zirconia and a second powder containing platinum, alumina, and a NO_x adsorbent (page 4, lines 20-30). The composition further contains a hydrocarbon adsorbent such as a zeolite (page 5, lines 50-60). In one embodiment, it is taught that the HC adsorbent may form a coating layer on a monolithic substrate wherein the first and second powder are supported on the coating layer (page 6, lines 1-40).

With regards to claims 1 and 2, it is taught by the reference that the first and second powder produce hydrogen from hydrocarbons and carbon monoxide in the exhaust gas and reduce nitrogen oxides with both the produced hydrogen and

Art Unit: 1725

hydrocarbons and carbon monoxide in the exhaust gas (page 4, lines 20-60). The zeolite functions to store the HCs during cold operation of the engine and to release the HCs during warm operation (page 5, lines 30-58). It appears that the composition of the exhaust gas would meet the relation claimed in claim 15.

It is taught that the second powder may further contain palladium (page 8, lines 10-25). The NO_x adsorbent, contained in the second powder, is formed of at least one element selected from the group consisting of alkaline metals, alkaline earth metals, and rare earth metals (page 8, lines 25-30).

With regards to the ratio recited in claim 1 and 16, this ratio is taken by the examiner as a statement of the composition's intended use in the purification of exhaust gas. With regard to claim 15, it is the position of the examiner that the claim requires a device which is capable of controlling the composition of the exhaust gas which is met by the reference at page 8, lines 35-55.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Ikeda et al.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1725

5. Claims 5 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noda et al. as applied above for claims 1-4, 6-16, 17-19, and 21-29 and further in view of Abe et al.

The teachings of Noda et al. are as described above for claims 1-4, 6-16, 17-19, and 21-29.

The difference between the reference and the claims is that Noda et al. does not teach the use of an alkaline earth metal in combination with the zirconium oxide as required by claims 5 and 20.

Abe et al. (US 5,164,350) discloses a layered catalyst composition useful in the purification of exhaust gases. Abe et al. teaches that the heat resistance of an inorganic oxide such as zirconium oxide may be improved by forming a compound oxide of zirconium and alkaline earth metal oxide (columns 5-6).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the composition of Noda et al. to include the use of an alkaline earth metal in combination with the zirconium oxide in light of the teachings of Abe et al. One would have been motivated to do so to improve the heat resistance of the composition. Because both compositions can be used in the purification of exhaust gases, one would have reasonable expectation of success from the combination.

6. Claims 8-10 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikeda et al. as applied to claims 1-2, 15-16, and 17 above, and further in view of Noda et al.

The teachings of Ikeda et al. are applied as above for claims 1-2, 15-16, and 17.

Ikeda et al. does not teach the use of a beta zeolite or that the zeolite contains ions.

Noda et al. (EP 0 782 880) teaches a catalyst-adsorbent useful in the purification of exhaust gases. With respect to the HC adsorbent, Noda et al. teaches that the adsorbent particles are composed mainly of zeolite, preferably high-silica, hydrogen form zeolites having a Si/2Al of 40 or more (page 5, lines 15-20). Suitable zeolites include ZSM-5, USY, and Beta zeolite (page 5, lines 28-30). It is taught that the zeolites may be used in combination to effect a wide variety of hydrocarbon adsorption (page 6, lines 35-45). The zeolite may further contain an ion such as Cu, Ag, or Au, or Mg, Ca, Sr, Ba, Y, La, Ti, Ce, Mn, Fe, Cr, Ni, and Zn (pages 5-6) to improve stability and heat resistance.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Ikeda et al. to include the use of beta zeolite in light of the teachings of Noda et al. Noda et al. teaches that beta zeolite is functionally equivalent to the zeolites taught by Ikeda et al. for HC adsorption in exhaust gas purification, thereby giving one of ordinary skill motivation to use it. One would have been further motivated to use combinations of zeolites in light of the teaching by Noda et al. that by doing so one would be able to adsorb a wider variety of hydrocarbons. Finally, one would have been motivated to include additional ions such as Cu, Ag, or Au, or Mg, Ca, Sr, Ba, Y, La, Ti, Ce, Mn, Fe, Cr, Ni, and Zn in light of the teaching by Noda et al. that doing so improves an improved composition.

Response to Arguments

7. Applicant's arguments filed August 6, 2003 have been fully considered but they are not persuasive.

Applicant argues that the Noda and Ikeda references do not teach the claimed ratio. This argument has been considered but is not persuasive. It is noted that the instant claims are directed toward a product and not a process of use. It is the position of the examiner that the ratio recited in the instant claims is merely a recitation of the instant product's intended use. Applicant has not demonstrated that the product as claimed differs structurally as a result of or because of this ratio. For device claims 15 and 17-29, the claims require a device for controlling combustion in the engine to produce exhaust gas – this is met by the references as both references teach cycling the exhaust gases and controlling combustion, i.e. fuel-rich and fuel-lean environments. The ratio again is taken as a statement of intended use which does not limit the system as claimed.

With regards to claim 30, applicant's calculations are noted. However, as discussed above, the exact ratio is not considered to limit the catalyst as claimed. Also, the calculations do not appear to be correct. The numbers in the ratios are inconsistent. The ratio for $\lambda=1.3$ appears as though it should be equal to 0.3.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (571) 272-1176. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1725

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CAI

March 22, 2004

Kiley Storer A4 1725
Kiley Storer 3/23/04